AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1.   (Currently Amended) A method of calibrating a transmitting part of a node in a wireless communication network, which communication network comprises at least a first radio node and a second radio node which can be arranged to be in radio communication with each other, and wherein at least one radio node receives radio signals from multiple antennas, said calibration method comprises the steps of

-*transmitting* ~~(605,705)~~ first pilots signals both from the first radio node to the second radio node and from the second radio node to the first radio node;

-*determining* ~~(610, 710)~~ in the second radio node a first estimate of the channel characteristics from the first radio node to the second radio node, and in the first radio node determining a second estimate of the channel characteristics from the second radio node to the first radio node, said determining based on respective received first pilot signals;

-*calculating* at least one *channel correction factor* in the first radio node based on the first and second channel estimates,

the calibration method **characterised by** the steps of:

-*transmitting* ~~(611, 711-712)~~ a modified second pilot signal from the first radio node to the second radio node, said modification based on the second channel estimate;

-*estimating* transmission errors ~~(612, 713)~~ in the second radio node, said

- 4 -

1089889

estimation based on the first channel estimate and the received second pilot signal and calculating a correction vector with correction terms for each of the multiple antennas based on the transmission errors;

-*exchanging* (615, 715) the correction vector from the second radio node to the first radio node; and

in that the step of calculating correction factors (620,720) comprises calculating one correction factor for each antenna, the correction factors are based at least partly on the respective correction terms in the correction vector, said correction factors adapted for use in transmissions from the first radio node to the second radio node.

2.   (Original) Calibration method according to claim 1, **wherein** the calibration method is initiated in predetermine time intervals.

3.   (Original) Calibration method according to claim 1, **wherein** the calibration method is initiated as a response of a measure of communication quality being below a predetermined threshold value.

4.   (Currently Amended) Calibration method according to any of claimsclaim 1 to 3, **wherein** the modification of the second pilot signal comprises a multiplication of a pilot signal with the complex conjugate of the second channel estimate.

5.   (Currently Amended) Calibration method according to any of claimsclaim 1 to 4, **wherein** the correction vector is exchanged in the form of a compact representation of the correction vector.

1089889

6.   (Currently Amended) Calibration method according to ~~any of claims~~claim 1 ~~to~~

5, **wherein** the first radio node ~~(A)~~ is provided with n_A antennas and the second

radio node ~~(B)~~ is provided with n_B antennas and wherein at least the first radio

node has at least two antennas, wherein

-in the first transmitting step ~~(605)~~ the first pilot signals, P_c, are column vectors;

-in the determining step ~~(610)~~ a first estimate, $\hat{H}_{A \to B}$, of the channel

characteristics from the first radio node to the second radio node is calculated in

the second radio node, and a second channel estimate $\hat{H}_{B \to A}$ of the channel

characteristics from the second radio node to the first radio node is calculated in

the first radio node;

-in the second transmitting step ~~(611)~~ the second pilot, P_s, is pre-multiplied

according to:

$$P_s \cdot H_{B \to A}^* \cdot 1_{n_B},$$

which at the second radio node will be received as R_s, and wherein $H_{B \to A}^*$ is the

complex conjugate of the second channel estimate, P_s is an $n_A \times n_A$ diagonal

matrix containing n_A individual pilot signals and 1_{n_B} is an all-one column vector

of dimension n_B;

-in the estimating step ~~(612)~~ the correction vector is calculated based on R_s

and $H_{A \to B}$, and comprises error corrections terms for each of the first radio

node's antennas; and

- 6 -

1089889

-in the calculating step (620) channel correction factors for each antenna are calculated based on the correction vector.

7. (Currently Amended) Calibration method according to ~~any of claims~~ claim 1 ~~to 5~~, **wherein** the first radio node ~~(A)~~ is provided with n_A antennas and the second radio node ~~(B)~~ is provided with n_B antennas and wherein at least the first radio node has at least two antennas, wherein the radio communication is based on Singular Value Decomposition (SVD), and

-in the first transmitting step ~~(705)~~ the first pilot signals, P_c, are column vectors;

-in the determining step ~~(610)~~ a first estimate, $\hat{H}_{A \rightarrow B}$, of the channel characteristics from the first radio node to the second radio node is calculated in the second radio node, and a second channel estimate $\hat{H}_{B \rightarrow A}$ of the channel characteristics from the second radio node to the first radio node is calculated in the first radio node;

-in the second transmitting step ~~(611)~~ the second pilot, P_d, is pre-multiplied with a pre-filter, $H_{B \rightarrow A}^{*}$, which is the complex conjugate of the second channel estimate, which as the second radio node will be received as

$$R_s = H_{A \rightarrow B} \cdot H_{B \rightarrow A}^{*} \cdot P_d;$$

-in the estimating step ~~(713)~~ the correction vector is calculated in the second node and based on $H_{B \rightarrow A}^{*}$ and $H_{A \rightarrow B}$, wherein $H_{A \rightarrow B}$ is estimated from the first pilot signal and $H_{B \rightarrow A}^{*}$ is estimated from R_s; and

1089889

-in the calculating step (720) channel correction factors for each antenna are calculated based on the correction vector.

8.   (Currently Amended) Calibration method according to ~~any of claims~~claim 1 ~~to 7~~, **wherein** the correction vector comprises representation of either delay-errors, phase-errors or amplitude-errors, or a combination of these errors.

9.   (Currently Amended) Calibration method according to ~~any of claims~~claim 1 ~~to 8~~, **wherein** a first part of the step of transmitting channel estimation symbols is performed in a first transmit time slot TX_1, wherein the second radio node transmit a pilot, P_C, which is received by the first radio node, which is in a receive mode; and
a second part of the step of transmitting channel estimation symbols is performed in a second transmit time slot TX_2, wherein the first radio node transmit a pilot, P_C, P_d or P_S which is received by the second radio node, which is in a receive mode.

10.   (Original) Calibration method according to claim 9, **wherein** the step of exchanging information between radio nodes is performed in a third transmit timeslot TX_3, wherein the second radio node is in regular transmit mode and transmits information on the radio channel to the first radio node, which is in receive mode.

1089889

11. (Original) Calibration method according to claim 10, **wherein** the first radio

node estimates the radio channel from the second radio channel to the first

radio node, $H_{B \rightarrow A}$, in the first transmit time slot TX$_1$.

12. (Currently Amended) Calibration method according to claim 10 ~~or 11~~, **wherein**

the second radio node estimates the radio channel from the first radio channel

to the second radio node, $H_{A \rightarrow B}$ in the second transmit time slot TX$_2$.

13. (Original) Calibration method according to claim 12, **wherein** the second radio

node further estimates a correction vector or correction term in the second

transmit time slot TX$_2$.

14. (Currently Amended) Calibration method according to ~~any of claims~~claim 10 ~~to~~

~~13~~, **wherein** the step of calculating correction factor or factors in the first radio

node is performed in the third transmit timeslot TX$_3$.

15. (Currently Amended) A communication system ~~(800)~~ for wireless

communication, the system comprising at least a first radio node and a second

radio node which can be arranged to be in radio communication with each

other, said communication system **characterised in** that the at least the first

radio node is calibrated with the aid of the second radio node by the use of the

calibration method according to ~~any of claims~~claim 1 ~~to 14~~.

16.   (Original) The communication system according to claim 15, **wherein** the at least one of the radio nodes of the system utilizes a multiantenna configuration as adapted for MIMO- based communication.

17.   (Currently Amended) A radio node adapted for wireless communication in a wireless network (800), which network comprises at least one further radio node, the radio node comprises:

-an exchanging module (232) adapted for receiving at least one first radio channel estimate from at least the further radio node;

-a channel estimating module (224) adapted for producing a second radio channel estimate from a radio signal received by the radio node;

-a calculating module (226) adapted for calculating a correction vector/term or a representation of a radio channel estimates based on the received first radio channel estimate and the second radio channel estimate; and

-a compensating module (234) for compensating radio transmissions from the radio node with at least one correction factor which is at least partly based on the calculated calibration,

and is **characterised by**:

-a pilot transmitting module (228) adapted for controlling the transmission of first pilot signal and a second pilot signal, wherein the second pilot signal is modified with the second radio channel estimate.

1089889

18.   (Original) The radio node according to claim 17, **wherein** the radio node further comprises means for initiating a calibration process, said initiating means adapted to initiate the calibration process in predetermine time intervals.

19.   (Original) The radio node according to claim 17, **wherein** the radio node further comprises means for initiating a calibration process, said initiating means adapted to initiate the calibration process as a response of a measure of communication quality being below a predetermined threshold value.

20.   (Currently Amended) The radio node according to ~~any of claims~~claim 17 ~~to 19~~, **wherein** the radio node utilizes a multiantenna configuration.

21.   (Currently Amended) The radio node according to ~~any of claims~~claim 17 ~~to 20~~, **wherein** the radio node is a mobile station ~~(815)~~.

22.   (Currently Amended) The radio node according to ~~any of claims~~claim 17 ~~to 20~~, **wherein** the radio node is a radio base station ~~(805)~~.

23.   (Currently Amended) The radio node according to ~~any of claims~~claim 17 ~~to 20~~, **wherein** the radio node is a relay station ~~(810)~~.

1089889